

Claims

What is claimed is:

1. A method for processing call signaling messages, the method comprises the steps of:

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a) receiving a plurality of call signaling messages;

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b) comparing a queue occupancy level of a call processing queue with a first queue occupancy threshold; and

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c) when queue occupancy level compares unfavorably with the first queue occupancy threshold, enqueueing the plurality of call signaling messages into the call processing queue based on types of call signaling messages.

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2. The method of claim 1, wherein the types of call signaling messages include dispensable messages, indispensable messages, and essential messages.

3. The method of claim 2, wherein step (c) further comprises:

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when a call signaling message of the plurality of call signaling messages is a dispensable message, deleting from the call processing queue a previously queued dispensable message when the previously dispensable message exists;

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enqueueing the call signaling message into the call processing queue when the previously queued dispensable message is deleted; and

when the call signaling message is an indispensable message or an essential message, enqueueing the call signaling message into the call processing queue.

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4. The method of claim 3 further comprises:

when the previously queued dispensable message does not exist and when the call signaling message is a dispensable message, dropping the call signaling message.

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5. The method of claim 1 further comprises:

comparing the queue occupancy level with a second queue occupancy threshold;

10 when the queue occupancy level compares unfavorably with the second queue occupancy threshold:

when a call signaling message of the plurality of call signaling messages is a dispensable message or an indispensable message, deleting from the call processing queue a

15 previously queued dispensable message when the previously dispensable message exists;

enqueueing the call signaling message into the call processing queue when the previously queued dispensable message is deleted; and

20 when the call signaling message is an essential message, enqueueing the call signaling message into the call processing queue

6. The method of claim 5 further comprises:

25 when the previously queued dispensable message does not exist and when the call signaling message is a dispensable message, dropping the call signaling message.

7. The method of claim 5 further comprises:

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when the previously queued dispensable message does not exist and when the call signaling message is an indispensable message, deleting from the call processing queue a previously queued indispensable message when the previously indispensable message exists; and

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enqueueing the call signaling message into the call processing queue when the previously queued indispensable message is deleted.

8. The method of claim 5 further comprises:

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when the previously queued dispensable message does not exist and when the call signaling message is an indispensable message, dropping the call signaling message.

9. The method of claim 2 further comprises, when in a sustained overloading condition, dequeuing a dispensable call signaling messages in a first dequeuing manner from the call processing queue.

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10. The method of claim 9, the first dequeuing manner further comprises at least one of FIFO and LIFO.

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11. The method of claim 1 further comprises:

maintaining a plurality of dequeuing lists, wherein the plurality of dequeuing lists track available locations in the call processing queue, an ordered list of types of call messages, an ordered list of dispensable messages, an ordered list of indispensable messages, and an ordered list of essential messages.

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12. The method of claim 11 further comprises updating the plurality of dequeuing lists when enqueueing changes occur, wherein the enqueueing changes occur when the

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queue occupancy level compares unfavorably with the first queue occupancy threshold or when the queue occupancy level compares unfavorably with a second queue occupancy threshold.

13. The method of claim 11 further comprises dequeuing dispensable call messages from the call processing queue in a LIFO manner based on the ordered list of dispensable messages when in a sustained overloading condition.

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a) receiving a plurality of call signaling messages;

b) enqueueing the plurality of call signaling messages into a call processing queue based on type of call signaling messages and queue occupancy level of the call processing queue; and

c) when in a sustained overload condition, dequeuing a first type of call signaling message from the call processing queue in a first dequeuing manner.

15. The method of claim 14, wherein the types of call signaling messages include dispensable messages, indispensable messages, and essential messages.

16. The method of claim 15 further comprises:

when the queue occupancy level compares unfavorably to a first queue occupancy threshold:

when a call signaling message of the plurality of call signaling messages is a dispensable message, deleting from the call processing queue a previously queued dispensable message when the previously dispensable message exists;

enqueueing the call signaling message into the call processing queue when the previously queued dispensable message is deleted; and

when the call signaling message is an indispensable message or an essential message, enqueueing the call signaling message into the call processing queue.

17. The method of claim 15 further comprises:

comparing the queue occupancy level with a second queue occupancy threshold;

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when the queue occupancy level compares unfavorably with the second queue occupancy threshold:

when a call signaling message of the plurality of call signaling messages is a dispensable message or an indispensable message, deleting from the call processing queue a previously queued dispensable message when the previously dispensable message exists;

enqueueing the call signaling message into the call processing queue when the previously queued dispensable message is deleted; and

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when the call signaling message is an essential message, enqueueing the call signaling message into the call processing queue.

18. The method of claim 17 further comprises:

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when the previously queued dispensable message does not exist and when the call signaling message is an indispensable message, deleting from the call processing queue a previously queued indispensable message when the previously indispensable message exists; and

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enqueueing the call signaling message into the call processing queue when the previously queued indispensable message is deleted.

19. The method of claim 14 further comprises:

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maintaining a plurality of dequeuing lists, wherein the plurality of dequeuing lists track available locations in the call processing queue, an ordered list of types of call signaling messages, an ordered list of dispensable messages, an ordered list of indispensable messages, and an ordered list of essential messages.

20. The method of claim 19 further comprises updating the plurality of dequeuing lists when enqueueing changes occur, wherein the enqueueing changes occur when the queue occupancy level compares unfavorably with a first queue occupancy threshold or when the queue occupancy level compares unfavorably with a second queue occupancy threshold.

21. The method of claim 19 further comprises dequeuing dispensable call messages from the call processing queue in a LIFO manner based on the ordered list of dispensable messages when in a sustained overloading condition.

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22. A call signal processing module comprises:

a call processing queue;

5 a processing module; and

memory operably coupled to the processing module, wherein the memory stores operational instructions that cause the processing module to: (a) receive a plurality of call signaling messages; (b) compare a queue occupancy level of the call processing queue with a first queue occupancy threshold; and (c) enqueue, when queue occupancy level compares unfavorably with the first queue occupancy threshold, the plurality of call signaling messages into the call processing queue based on types of call signaling messages.

15 23. The call signal processing module of claim 22, wherein the types of call signaling messages include dispensable messages, indispensable messages, and essential messages.

24. The call signal processing module of claim 22, wherein the memory further comprises operational instructions that cause the processing module to:

20 delete a previously queued dispensable message from the call processing queue when a call signaling message of the plurality of call signaling messages is a dispensable message and when the previously dispensable message exists;

25 enqueue the call signaling message into the call processing queue when the previously queued dispensable message is deleted; and

enqueue the call signaling message into the call processing queue when the call signaling message is an indispensable message or an essential message.

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25. The call signal processing module of claim 22, wherein the memory further comprises operational instructions that cause the processing module to:

5 compare the queue occupancy level with a second queue occupancy threshold;

when the queue occupancy level compares unfavorably with the second queue occupancy threshold:

10 delete a previously queued dispensable message from the call processing queue when a call signaling message of the plurality of call signaling messages is a dispensable message or an indispensable message and when the previously dispensable message exists;

15 enqueue the call signaling message into the call processing queue when the previously queued dispensable message is deleted; and

enqueue the call signaling message into the call processing queue when the call signaling message is an essential message.

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26. The call signal processing module of claim 25, wherein the memory further comprises operational instructions that cause the processing module to:

25 delete a previously queued indispensable message from the call processing queue when the previously queued dispensable message does not exist and when the call signaling message is an indispensable message and when the previously indispensable message exists; and

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enqueue the call signaling message into the call processing queue when the previously queued indispensable message is deleted.

27. The call signal processing module of claim 25, wherein the memory further
5 comprises operational instructions that cause the processing module to:

drop the call signaling message when the previously queued dispensable message does not exist and when the call signaling message is an indispensable message.

Sub B1 } 10 28. The call signal processing module of claim 25, wherein the memory further comprises operational instructions that cause the processing module to:

dequeue a dispensable call signaling messages in a first dequeuing manner from the call processing queue when in a sustained overloading condition.

15 29. The call signal processing module of claim 25, wherein the memory further comprises operational instructions that cause the processing module to:

maintain a plurality of dequeuing lists, wherein the plurality of dequeuing lists track
20 available locations in the call processing queue, an ordered list of types of call messages, an ordered list of dispensable messages, an ordered list of indispensable messages, and an ordered list of essential messages.

30. The call signal processing module of claim 29, wherein the memory further
25 comprises operational instructions that cause the processing module to:

update the plurality of dequeuing lists when enqueueing changes occur, wherein the enqueueing changes occur when the queue occupancy level compares unfavorably with the

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- dequeue dispensable call messages from the call processing queue in a LIFO manner based on the ordered list of dispensable messages when in a sustained overloading condition.

32. A call signal processing module comprises:

a call processing queue;

5 a processing module; and

memory operably coupled to the processing module, wherein the memory stores operational instructions that cause the processing module to: (a) receive a plurality of call signaling messages; (b) enqueue the plurality of call signaling messages into the call processing queue based on type of call signal messages and queue occupancy level of the call processing queue; and (c) dequeue a first type of call signal message from the call processing queue in a first dequeuing manner when in a sustained overload condition.

33. The call signal processing module of claim 32, wherein the types of call signaling messages include dispensable messages, indispensable messages, and essential messages.

34. The call signal processing module of claim 33, wherein the memory further comprises operational instructions that cause the processing module to:

20 when the queue occupancy level compares unfavorably to a first queue occupancy threshold:

delete from the call processing queue a previously queued dispensable message when a call signaling message of the plurality of call signaling messages is a dispensable message and when the previously dispensable message exists;

enqueue the call signaling message into the call processing queue when the previously queued dispensable message is deleted; and

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delete from the call processing queue a previously queued indispensable message when the previously queued dispensable message does not exist and when the call signaling message is an indispensable message and when the previously indispensable message exists; and

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maintain a plurality of dequeuing lists, wherein the plurality of dequeuing lists track available locations in the call processing queue, an ordered list of types of call messages, an ordered list of dispensable messages, an ordered list of indispensable messages, and an ordered list of essential messages.

38. The call signal processing module of claim 37, wherein the memory further comprises operational instructions that cause the processing module to: update the plurality of dequeuing lists when enqueueing changes occur, wherein the enqueueing changes occur when the queue occupancy level compares unfavorably with a first queue occupancy threshold or when the queue occupancy level compares unfavorably with a second queue occupancy threshold.

- 20 39. The call signal processing module of claim 33, wherein the memory further comprises operational instructions that cause the processing module to: dequeue dispensable call messages from the call processing queue in a LIFO manner based on the ordered list of dispensable messages when in a sustained overloading condition.